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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/773,968

Filing Date: February 06, 2004

Appellant(s): SHIRLEY, PAUL D.

John Reed
For Appellant

EXAMINER'S ANSWER

This is in response to the supplemental appeal brief filed 11/23/09 appealing from the final office action mailed 5/12/09.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

Acknowledgement is made of the continuation application, Serial Number 11/497,140, filed as of 8/1/06, which is of the same inventive concept as the present application, Serial Number 10/773968 and which is also presently subject to review at the Board of Appeals. It would be in Appellant's best interest to have both applications reviewed simultaneously to effect compact prosecution.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct.

- 1) Claims 1, 2, 16, and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujimoto (US 5,939,139).
- 2) Claims 1-7, 10, 12-18, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Tateyama et al (US 5,919,520).

3) Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto (US 5,939,139) in view of Tateyama et al (US 5,919,520).

4) Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tateyama et al (US 5,919,520) in view of Matsuyama (US 2002/0176936).

Additionally, there are the following rejections which were omitted:

5) Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tateyama et al (US 5,919,520) in view of Chappa et al (US 7,077,910).

6) Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tateyama et al (US 5,919,520) in view of Fujimoto (US 5,939,139).

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

| | | |
|--------------|----------------|---------|
| 5,939,139 | FUJIMOTO | 8-1999 |
| 5,919,520 | TATEYAMA ET AL | 7-1999 |
| 2002/0176936 | MATSUYAMA | 11-2002 |
| 7,077,910 | CHAPPA ET AL | 7-2006 |

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

102(b) Rejections

Claims 1, 2, 16, 18, 19, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujimoto (US 5,939,139).

Fujimoto provides a resist application device comprising a casing or housing (50) having therein a rotatable substrate support (2); a resist dispenser (21) configured to deposit resist onto a substrate positioned on said support; a control fluid supply (22, 44) capable of effecting localized change in a rate of evaporation of said deposited resist, the control fluid supply (see Fig. 1) configured to dispense a solvent-free gas, the gas being air or an inert gas (col. 5, lines 23-30; col. 7, lines 14-32); and further comprising a controller (20) cooperative with said control fluid supply such that said control fluid supply is capable of varied placement of control fluid onto said deposited resist to effect a substantially uniform thickness layer thereof.

With respect to claim 2, see movable nozzle (22) for supplying air or inert gas.

With respect to claim 16, the apparatus is enclosed by housing or casing (50) and thus is environmentally controllable.

With respect to claim 20, note that the nozzle (22) can supply air.

Claims 1-7, 10, 12-18, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Tateyama et al (US 5,919,520), hereinafter referred to as Tateyama.

Tateyama provides a resist application device comprising a rotatable substrate support (10); a moveable resist supply (BL) configured to deposit resist onto a substrate (W) positioned on said support; a control fluid supply (80; see Fig. 2) capable of effecting localized change in a rate of evaporation of said deposited resist, said control fluid supply including a supply of pressurized gas (i.e., air); and a controller (CPU, 67) cooperative with said control fluid supply such that said control fluid supply is capable of varied placement of said control fluid onto said deposited resist to effect a substantially uniform thickness layer thereof (see Figs. 2-5).

With respect to claims 1, 5, 14, 16, and 20, Tateyama provides a control fluid supply of oxygen (col. 8, lines 45+) which includes no solvent thus, the instantly claim invention remains structurally anticipated.

With respect to claim 2, see movable nozzle (80) for supplying air (col. 8, lines 44-51).

With respect to claim 3, plural fluid dispensing nozzles are defined by the use of plural spouting holes (col. 8, lines 45-48).

With respect to claim 4, the plural spouting holes constituting plural nozzles are fixed to the beam (20) capable of being positioned/fixed as desired with respect to the surface of the substrate.

With respect to claim 5, the use of a controller having a detector and feedback apparatus is evidenced by Tateyama (col. 6, lines 63 to col. 7, line 56). Tateyama uses controller (67) with height sensor (66) for sensing parameter of distance of the nozzles with respect to the surface of the treated substrate wherein the height sensor coacts with nozzle elevator (40A) and scanning mechanism (40) to adjust distance of nozzles with respect to the treated substrate to make up for any unevenness of the substrate.

With respect to claim 7, the fluid supply includes air to define airflow supply.

With respect to claim 10, airflow supplied by nozzle (80) is directed vertically downward as evidenced by Fig. 2 and said nozzle is positioned as desired by the used with respect to the surface of the substrate via use of controller or CPU (67).

With respect to claims 12 and 13, the scanning mechanism (40)/beam (20) as controlled by the CPU (67) enables all nozzles of the solution dispenser and fluid supply to move relative to the substrate as desired by the user.

With respect to claims 14, 16, and 20, the application device is enclosed in a housing or module as evidenced by Fig. 7 wherein processing of the substrate takes place.

With respect to claim 15, the recessed area beneath the substrate support or chuck (10) would constitute a drain for receipt of excess fluids used in the device.

103 Rejections

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto (US 5,939,139) in view of Tateyama et al (US 5,919,520).

The teachings of Fujimoto have been mentioned above but Fujimoto is silent concerning the control fluid supply comprising plural nozzles. However, it was known in the art at the time the invention was made to provide for a control fluid supply including plural outlets (85) defining plural nozzles to supply a control fluid such as oxygen to a resist coated substrate along a length of the substrate surface as evidenced by Tateyama (col. 8, lines 45+). It would have been obvious to one of ordinary skill in the art to provide plural nozzles as taught by Tateyama in the Fujimoto device as the control fluid supplied would enable coverage of a greater surface area of the treated substrate. With respect to the positioning of the nozzles, Fujimoto provides a controller (20) to facilitate positioning of the control fluid supply such that it would be within the purview of one skilled in the art to control positioning of the control fluid supply nozzles as defined by the combination above as desired with respect to the surface of the substrate.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tateyama et al (US 5,919,520) in view of Matsuyama (US 2002/0176936).

The teachings of Tateyama have been mentioned above but Tateyama fails to teach or suggest humidity or temperature supply/control. However, it was known in the art at the time the invention was made, to provide humidity and/or temperature control in airspace adjacent the wafer chuck to control the environment about the substrate during processing as evidenced by Matsuyama [0057]. It would have been obvious to one of ordinary skill in the art to provide humidity and/or temperature control in airspace adjacent the wafer chuck as taught by Matsuyama in the device of Tateyama in order to control the environment about the substrate during processing to provide for uniform treatment including coating of the substrate.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tateyama et al (US 5,919,520) in view of Chappa et al (US 7,077,910).

Tateyama provides a resist application device as mentioned above but is silent concerning the operation of the coating device in an automated mode and manual mode to allow the operator input in the latter mode. However, it was known in the coating art, at the time the invention was made, to provide for manual or automated operation of coating parameters in a coating device with the manual operation enabling operator input as evidenced by Chappa (col. 10, lines 51-62). In light of the teachings of Chappa, it would have been obvious to one of ordinary skill in the art to provide an automated mode and manual mode of control in the Tateyama device in order to facilitate of operation of the coating device with or without the need of an operator.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tateyama et al (US 5,919,520) in view of Fujimoto (US 5,939,139).

The teachings of Fujimoto have been mentioned above but Fujimoto is silent concerning the control fluid supply being an inert gas. However, it was known in the art at the time the invention was made to provide either oxygen or an inert gas as the control fluid supply to treat a coated substrate as evidenced by Fujimoto (col. 5, lines 23-26; col. 7, lines 14-32). In view of the teachings of Fujimoto, it would have been obvious to one of ordinary skill in the art to optionally provide an inert gas instead of oxygen as the control fluid supply in the apparatus of Tateyama because the gas would remain solvent free yet serve to treat the resist coated substrate. One of ordinary skill in the art would expect that the inert gas would less likely interact with the coating solution applied to the substrate.

(10) Response to Argument

Appellant contends that Fujimoto does not anticipate the instantly claimed invention because Fujimoto does not provide for a control fluid [supply] for the intended use/purpose of effecting a local change in a rate of evaporation of deposited resist.

In response to this contention, Appellant should note that a device or apparatus is claimed and structure is what is looked at for the basis of determination of patentability while the intended use of the apparatus and its parts are not given patentable weight. Fujimoto structurally anticipates the instantly claimed invention because Fujimoto provides a device equivalent in structure to the instantly claimed. The Fujimoto device is capable of supplying control fluid (i.e., gas) to an applied resist or any desired coating layer on a substrate supported in the device and because the control fluid is supplied to the coated/treated substrate, the Fujimoto device is expectantly capable of the intended use/purpose of effecting a local change in a rate of evaporation of deposited resist.

Appellant contends that the anticipation of the instantly claimed invention under Fujimoto should be withdrawn because the Examiner has not read Appellant's local nature of the evaporation rate of the deposited resist and its meaning in line with the specification.

With respect to this argument, Appellant is reminded that the Examiner has read the instantly claimed invention with the broadest reasonable interpretation. The intended use of the control fluid supply for the intended use/purpose of effecting a local change in a rate of evaporation of deposited resist remains to have no patentable weight.

Appellant contends that the Fujimoto device would not be capable of effecting any change in a resist layer because Fujimoto processes the wafer different than Appellant so as to provide a layer over deposited resist so that the Fujimoto device would not be capable of effecting local change in the evaporation rate of an applied resist layer via the use of control fluid supply.

This contention is well taken in that it would not appear that Fujimoto processes the wafer step by step as explicitly claimed by Appellant. However, because Fujimoto's intended use of the device to allow for the deposition of layers of coating material would not exclude the capability of the device to allow a user to apply a single layer of coating material to the substrate followed by application of the control fluid or gas to the treated substrate. Fujimoto remains to provide the structure or parts to enable a user to do so if so desired. The Fujimoto device has never been applied in the 102(b) rejection to teach Appellant's same processing of the wafer but more so to teach that inherently, the Fujimoto device would be structurally capable of processing a wafer having resist deposited thereon if so desired because the Fujimoto device is equivalent in structure to the instantly claimed invention. Any desired coating material applied on a supported

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wafer in the Fujimoto device would be able to receive a supply of desired gas (inert or otherwise) for whatever desired purpose. Thus, the anticipation rejection of the instantly claimed invention under Fujimoto has been sustained.

Appellant argues the removal of Fujimoto because Fujimoto does not teach or suggest a resist depositing device or method of depositing resist in a manner instantly claimed.

In response to this contention, the Fujimoto resist dispenser (21) has been read merely as a dispenser/nozzle capable of applying coating material in the form of resist onto the substrate in the device. Moreover, as evidenced by col. 7, lines 40-44, it would appear that the user would be able to use the Fujimoto device [including the dispensing nozzle] to apply photoresist to the substrate if so desired.

In view of the anticipation rejection of the instantly claimed invention under Tateyama, Appellant contends that Tateyama should be withdrawn because Tateyama does not provide for a control fluid [supply] for the intended use/purpose of effecting a localized change in a rate of evaporation of deposited resist nor does Tateyama provide for improved uniform thickness of deposited resist as suggested by the Examiner.

In response to this contention, Appellant should readily appreciate that Tateyama structurally anticipates the instantly claimed invention because the device of Tateyama is equivalent in structure to the instantly claimed invention. Tateyama provides a device capable of functioning to process an applied resist or any desired coating layer to be applied on the substrate with the control fluid supply nozzle (80) which is able to be moved about the surface of the coated substrate. As mentioned previously, the intended use of the apparatus to change an evaporation rate has not been given patentable weight. In addition, Tateyama provides for a

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device designed/arranged to make use of the fluid supply nozzle (80) to act if so desired as an air knife (col. 8, lines 45-52) so as to remove excess applied coating material which would serve to promote uniformity of the applied coating/resist on the substrate.

Appellant contends that the obviousness rejection of claims 3 and 4 under Fujimoto in view of Tateyama is improper because the combination does not teach a plurality of moveable fluid dispensing nozzles capable of depositing a control fluid onto a portion of a deposited resist layer to produce a local change in deposited layer evaporation rate.

This argument is not deemed persuasive because the combined teachings of Fujimoto and Tateyama is deemed proper in that while Fujimoto provides for a single nozzle, Tateyama recognizes use of plural nozzles (col. 8, lines 45+). One of ordinary skill in the art would readily appreciate the use of plural nozzles for the benefit of enabling the control fluid to be supplied to a greater surface area of the treated substrate all at one time. This in return would likely speed up the processing including drying of the coated substrate.

Another Appellant contention is that the obviousness rejection of claims 8 and 9 under Tateyama in view of Matsuyama is improper because Tateyama does not teach the claimed device for a humidity and temperature supply as a way to effect a local change in evaporation rate.

This argument is deemed moot in that the Examiner provides in the obviousness rejection that Tateyama, the primary reference, does not teach the humidity or temperature supply but the secondary reference to Matsuyama does provide humidity/temperature control via supply of a desired moisture and/or temperature within the housing wherein resist deposition occurs. The motivation for the combination, while not for effecting a local change in evaporation rate, is for

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the benefit of controlling processing of the wafer to effect a desired uniform coating wafer type product.

Appellant provides further that Matsuyama would not be combinable with the teachings of Tateyama because Matsuyama, the secondary reference is defective for failing to teach a control fluid which the Examiner has misread.

This argument is not deemed convincing to withdraw the obviousness rejection of claims 8 and 9 under Tateyama in view of Matsuyama because Tateyama, the primary reference provides structure which would constitute a control fluid nozzle (80) capable of effecting a local change in evaporation rate. Matsuyama, the secondary reference has not been relied upon to teach such a control fluid nozzle. Thus, rejection of the instantly claimed invention has been sustained.

An Appellant contention with respect to claim 11 is that the combination of Tateyama in view of Chappa is improper because neither patent teaches the claimed localized application of a control fluid to the deposited resist layer of the independent claim from which they depend.

As mentioned previously, Appellant's intended use of the device to effect localized application of a control fluid to the deposited resist layer would be an insufficient ground to warrant a grant of patentability because Tateyama as applied to independent claim 5, from which depends claim 11, provides a device having equivalent structure as instantly claimed and thus would be capable of functioning as claimed to allow for control in the local change in evaporation rate of a deposited layer on the substrate. The combination of Tateyama with Chappa in the rejection of claim 11 is still deemed proper because the proper motivation for the combination has been provided as required by *Graham v. Deere*.

Finally, as argued with the 103 rejections applied above, Appellant contends that the obviousness rejection of claim 19 under Tateyama in view of Fujimoto is improper due to neither teaching the claimed localized application of a control fluid to the deposited resist layer of the independent claim from which they depend.

As mentioned previously, Appellant's intended use of the device to effect localized application of a control fluid to the deposited resist layer would be an insufficient ground to warrant a grant of patentability because Tateyama as applied to independent claim 16, from which depends claim 19, provides a device having equivalent structure as instantly claimed and thus would be capable of functioning as claimed to allow for control in the local change in evaporation rate of a deposited layer on the substrate. Thus, the combination of Tateyama with Fujimoto in the rejection of claim 19 is still deemed proper because the proper motivation for the combination has been provided as required by *Graham v. Deere*.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Laura Edwards/

Conferees:

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